

**What is claimed is:**

- 1           1. A switch comprising:  
2           a plurality of field effect transistors connected in series, each field effect transistor  
3 including a gate, a source, and a drain;  
4           said gate of one of said series connected field effect transistors being a different  
5 size from said gate of another series connected field effect transistor.
- 1           2. The switch as claimed in claim 1, wherein said gate of one of said plurality of  
2 series connected field effect transistor has a longer gate length and/or gate width than said  
3 gate of said other series connected field effect transistor.
- 1           3. The switch as claimed in claim 1, wherein said gate of one of said plurality of  
2 series connected field effect transistor has a distance to its drain port that is less than a  
3 distance to its source port.
- 1           4. The switch as claimed in claim 1, wherein said gate of one of said plurality of  
2 series connected field effect transistor has a distance to its source port that is less than a  
3 distance to its drain port.
- 1           5. The switch as claimed in claim 3, wherein said gate of said other series  
2 connected field effect transistor has a distance to its source port that is equal to a distance  
3 to its drain port.
- 1           6. The switch as claimed in claim 4, wherein said gate of said other series  
2 connected field effect transistor has a distance to its source port that is equal to a distance  
3 to its drain port.
- 1           7. The switch as claimed in claim 1, wherein the different gate sizes increase a  
2 parasitic capacitance within the switch.
- 1           8. A switch comprising:

2           a plurality of dual-gate field effect transistors connected in series, each dual-gate  
3 field effect transistor including two gates, a source, and a drain;

4           one of said series connected dual-gate field effect transistors having a modified  
5 gate therein that is of a different size from gates of other series connected dual-gate field  
6 effect transistors.

1           9. The switch as claimed in claim 8, wherein said modified gate of said series  
2 connected dual-gate field effect transistor has a longer gate length and/or gate width than  
3 gates of said other series connected dual-gate field effect transistor.

1           10. The switch as claimed in claim 8, wherein said modified gate of said series  
2 connected dual-gate field effect transistor has a distance to its drain port that is less than a  
3 distance to its source port.

1           11. The switch as claimed in claim 8, wherein said modified gate of said series  
2 connected dual-gate field effect transistor has a distance to its source port that is less than  
3 a distance to its drain port.

1           12. The switch as claimed in claim 10, wherein gates of said other series  
2 connected dual-gate field effect transistors have a distance to its source port that is equal  
3 to a distance to its drain port.

1           13. The switch as claimed in claim 11, wherein gates of said other series  
2 connected dual-gate field effect transistors have a distance to its source port that is equal  
3 to a distance to its drain port.

1           14. The switch as claimed in claim 8, wherein a second series connected dual-  
2 gate field effect transistor has a modified gate therein that is of a different size from gates  
3 of other series connected dual-gate field effect transistors.

1           15. The switch as claimed in claim 8, wherein said dual-gate field effect  
2 transistors are high-electron-mobility-transistors.

1           16. The switch as claimed in claim 8, wherein the different gate sizes increase a  
2 parasitic capacitance within the switch.

1           17. The switch as claimed in claim 8, wherein said dual-gate field effect  
2 transistors include a transistor connection segment between said gates and a heavily  
3 doped cap layer fabricated upon said transistor connection segment between said gates.

1           18. A high-electron-mobility-transistor, comprising:  
2 two gate fingers;  
3 a transistor connection segment between said gate fingers; and  
4 a heavily doped cap layer fabricated upon said transistor connection segment  
5 between said gate fingers.

1           19. The high-electron-mobility-transistor as claimed in claim 18, wherein said  
2 gate fingers are of different sizes.

1           20. The high-electron-mobility-transistor as claimed in claim 19, wherein one of  
2 said gate fingers has a distance to its source port that is less than a distance to its drain  
3 port.

1           21. The high-electron-mobility-transistor as claimed in claim 19, wherein one of  
2 said gate fingers has a distance to its drain port that is less than a distance to its source  
3 port.

1           22. A radio frequency single pole double throw switch, comprising:  
2 a receiver port;  
3 a transmitter port;  
4 an antenna port;  
5 a receiver section connecting said receiver port to said antenna; and  
6 a transmitter section connecting said transmitter port to said antenna;  
7 said receiver section including a plurality of dual-gate field effect transistors  
8 connected in series, each dual-gate field effect transistor including two gates, a source,  
9 and a drain such that one of said series connected dual-gate field effect transistors has a

10 modified gate therein that is of a different size from gates of other series connected dual-  
11 gate field effect transistors.

1 23. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein a source of said modified gate transistor is connected to said receiver port.

1 24. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein a drain of said modified gate transistor is connected to said antenna port.

1 25. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein a second series connected dual-gate field effect transistor has a second modified  
3 gate therein that is of a different size from gates of other series connected dual-gate field  
4 effect transistors.

1 26. The radio frequency single pole double throw switch as claimed in claim 25,  
2 wherein a source of said modified gate transistor is connected to said receiver port and a  
3 drain of said second modified gate transistor is connected to said antenna port.

1 27. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein said dual-gate field effect transistors are high-electron-mobility-transistors.

1 28. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein said modified gate of said series connected dual-gate field effect transistor has a  
3 longer gate length and/or gate width than gates of said other series connected dual-gate  
4 field effect transistor.

1 29. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein said modified gate of said series connected dual-gate field effect transistor has a  
3 distance to its drain port that is less than a distance to its source port.

1 30. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein said modified gate of said series connected dual-gate field effect transistor has a  
3 distance to its source port that is less than a distance to its drain port.

1           31. The radio frequency single pole double throw switch as claimed in claim 29,  
2 wherein gates of said other series connected dual-gate field effect transistors have a  
3 distance to its source port that is equal to a distance to its drain port.

1           32. The radio frequency single pole double throw switch as claimed in claim 30,  
2 wherein gates of said other series connected dual-gate field effect transistors have a  
3 distance to its source port that is equal to a distance to its drain port.

1           33. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein the different gate sizes increase a parasitic capacitance within the switch.

1           34. The radio frequency single pole double throw switch as claimed in claim 22,  
2 wherein said dual-gate field effect transistors include a transistor connection segment  
3 between said gates and a heavily doped cap layer fabricated upon said transistor  
4 connection segment between said gates.

1           35. A radio frequency single pole double throw switch, comprising:  
2 a receiver port;  
3 a transmitter port;  
4 an antenna port;  
5 a receiver section connecting said receiver port to said antenna; and  
6 a transmitter section connecting said transmitter port to said antenna;  
7 said receiver section including a plurality of field effect transistors connected in  
8 series, each field effect transistor including a gate, a source, and a drain such that one of  
9 said series connected field effect transistors has a modified gate therein that is a different  
10 size from said gate of another series connected field effect transistor.

1           36. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein the source of said modified gate transistor is connected to said receiver port.

1           37. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein the drain of said modified gate transistor is connected to said antenna port.

1           38. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein a second series connected field effect transistors has a second modified gate  
3 therein that is of a different size from gates of other series connected field effect  
4 transistors.

1           39. The radio frequency single pole double throw switch as claimed in claim 38,  
2 wherein the source of said modified gate transistor is connected to said receiver port and  
3 the drain of said second modified gate transistor is connected to said antenna port.

1           40. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein said modified gate of said series connected field effect transistor has a longer  
3 gate length and/or gate width than gates of said other series connected field effect  
4 transistor.

1           41. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein said modified gate of said series connected field effect transistor has a distance  
3 to its drain port that is less than a distance to its source port.

1           42. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein said modified gate said series connected field effect transistor has a distance to  
3 its source port that is less than a distance to its drain port.

1           43. The radio frequency single pole double throw switch as claimed in claim 41,  
2 wherein gates of said other series connected field effect transistors have a distance to its  
3 source port that is equal to a distance to its drain port.

1           44. The radio frequency single pole double throw switch as claimed in claim 42,  
2 wherein gates of said other series connected field effect transistors have a distance to its  
3 source port that is equal to a distance to its drain port.

1           45. The radio frequency single pole double throw switch as claimed in claim 35,  
2 wherein the different gate sizes increase a parasitic capacitance within the switch.

1           46. The radio frequency single pole double throw switch claimed in claim 35,  
2   wherein the different gate sizes improve the linearity without impacting the ESD and  
3   EOS ruggedness.